REMARKS

The application has been reviewed in light of the Office Action dated June 15, 2006. Claims 12 and 16-23 are pending, with claims 1-6, 7-11 and 13-15 having previously been canceled, without prejudice or disclaimer. By this Amendment, claims 22 and 23 have been canceled, and claims 12 and 16-21 have been amended to clarify the claimed invention. Accordingly, claims 12 and 16-21 are now pending, with claims 12 and 16 being in independent form.

Claims 12 and 16-21 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over U.S. Patent No. 4,902,584 to Uchiyama et al. Claims 12 and 16-23 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Uchiyama in view of U.S. Patent No. 5,156,693 to Ide et al. Claims 12 and 16 and 18-23 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Ide in view of U.S. Patent No. 4,920,007 to Sawamura et al.

Applicant has carefully considered the Examiner's comments and the cited art, and respectfully submits that independent claims 12 and 16 are patentable over the cited art, for at least the following reasons.

This application relates to an optical phase variation type data recording medium. More specifically, the optical phase variation type data recording medium comprises a reflective layer, a phase variation type recording layer consisting mainly of Ag, In, Sb and Te, and one or more protection layers. Such a recording medium allows data to be recorded, reproduced or erased when illuminated by a light beam, particularly a laser beam, and is based on the transition between the crystal phase and the non-crystal phase or between the crystal phases. Generally, to record data in a phase variation type optical recording medium, amorphous portions are formed in a recording layer of the medium. Amorphous portions cannot be formed unless the recording

layer is heated to above its melting point and then cooled at a sufficiently high speed. On the other hand, it is necessary that the recording layer, except for its recorded portions, be protected from the influence of heat as far as possible. Otherwise, the boundary between the recorded portions and non-recorded portions would be unclear, or the recorded portions would even be crystallized and erased. Such deleterious effects can be avoided if excessive heat generated in the recording layer is released toward a protection layer having a high thermal conductivity, i.e., heat transfer within the layer or film is reduced.

Applicant devised, after substantial experimentation and investigation, an optical recording medium having such a protection layer. Applicant found that such a protection layer can be constituted by SiO_2 as a basic material, and a compound having a thermal conductivity greater than or equal to 10 W/m.deg when in a bulk state. The compound comprises silicon nitride in a molar ratio with the basic material of 10% to 85% silicon nitride. The protection layer has a thermal conductivity which allows amorphous portions to be recorded in the recording layer through heating followed by rapid cooling, while protecting other portions of the recording layer from heating during the recording to the amorphous portions. Each of independent claims 12 and 16 addresses these features, as well as additional features.

Uchiyama, as understood by Applicant, proposes a magneto-optical recording medium comprising a substrate, a magnetic recording layer and a protective layer. Uchiyama proposes use of a magnetic recording layer formed from alloys containing rare earth elements and transition metals, such as TbFeCo, GdFeCo, GdTbFeCo, etc.

Although Uchiyama proposes adding phase conversion type materials to the recording layer, the recording medium proposed by Uchiyama, even with the phase conversion type materials added to the recording layer, is not suitable for use with an optical disc recording or

reproducing apparatus. For example, the recording medium proposed by Uchiyama does not include a reflective layer, and Uchiyama does not suggest adding a reflective layer to enable the recording medium to be used in optical recording.

Moreover, Uchiyama proposes use of a protective layer comprising a combination of silicon oxide and silicon nitride in order to enhance (i) corrosion resistance of the recording layer and (ii) adhesion of the recording layer to a substrate. Uchiyama does not disclose or suggest, however, that such a protective layer would have advantages when used in an optical recording medium wherein thermal conductivity of the protective layer allows amorphous portions to be recorded in the phase-variation type recording layer through heating followed by rapid cooling, while protecting other portions of the recording layer from heating during the recording to the amorphous portions. Uchiyama is simply not relevant to the subject matter of claim 12.

Ide proposes an optical information recording medium comprising a recording layer consisting essentially of Ag, In, Te and Sb. The optical information recording medium proposed by Ide includes a heat-resistance protective layer, and Ide proposes a laundry list of materials which may be used in the heat-resistance protective layer. Although Ide mentions that a mixture of the materials can be used, no guidance is provided for doing so.

As previously pointed out in the record, Ide does not teach or suggest including in an optical information recording medium a protection layer constituted by SiO_2 as a basic material, and a compound having a thermal conductivity greater than or equal to 10 W/m.deg when in a bulk state, and comprising silicon nitride in a molar ratio with the basic material of 10% to 85% silicon nitride.

Further, contrary to the contention in the Office Action, it would not have been obvious to combine the teachings of Uchiyama and Ide. As pointed out above, Uchiyama proposes a

magneto-optical recording medium which operates by a different physical principle than an optical information recording medium, and therefore there is no motivation for modifying the magneto-optical recording medium proposed by Uchiyama by applying the teachings of Ide which are directed to an optical information recording medium.

Conversely, there is no motivation for modifying the optical information recording medium proposed by Ide to add the protective layer proposed by Uchiyama, since the protective layer is proposed by Uchiyama to address the problems in a magneto-optical recording medium, and there is no teaching or suggestion in Uchiyama that the protective layer proposed therein is suitable for an optical information recording medium wherein thermal conductivity of the protective layer allows amorphous portions to be recorded in the phase-variation type recording layer through heating followed by rapid cooling, while protecting other portions of the recording layer from heating during the recording to the amorphous portions.

Sawamura, as understood by Applicant, proposes a magneto-optical recording medium including a GdTbFe (or GdTbFeCo) magnetic recording layer and a protective layer for improving the durability and corrosion resistance of the magnetic recording layer.

Therefore, Sawamura, like Uchiyama, is not relevant to the subject matter of claim 12 of the present application, and for reasons similar to those stated hereinabove, such subject matter would not have been obvious from Sawamura and Ide. As pointed out above, there is no motivation to modify an optical information recording medium proposed by one reference (Ide), by adding elements of a magneto-optical recording medium proposed by another reference (Sawamura or Uchiyama).

Applicant simply does not find disclosure or suggestion in the cited art of an optical phase variation type data recording medium comprising a reflective layer, a phase variation type

recording layer consisting mainly of Ag, In, Sb and Te, and one or more protection layers, wherein the protection layer comprises SiO_2 as a basic material, and a compound having a thermal conductivity greater than or equal to 10 W/m.deg when in a bulk state, the compound comprising silicon nitride in a molar ratio with the basic material of 10% to 85% silicon nitride, and the thermal conductivity of the protection layer allows amorphous portions to be recorded in the recording layer through heating followed by rapid cooling, while protecting other portions of the recording layer from heating during the recording to the amorphous portions, as provided by the subject matter of amended claim 12.

Independent claim 16 is patentably distinct from the cited art for at least similar reasons. Accordingly, for at least the above-stated reasons, Applicant respectfully submits that claims 12 and 16, and the claims depending therefrom, are patentable over the cited art.

In view of the remarks hereinabove, Applicant submits that the application is now in condition for allowance, and earnestly solicits the allowance of the application.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition. The Patent Office is hereby authorized to charge any fees that may be required in connection with this amendment and to credit any overpayment to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,

Paul Teng, Reg. No. 40,837
Attorney for Applicant
Cooper & Dunham LLP
Tel.: (212) 278-0400